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AUTHOR Lee, Valerie E.; Frank, Kenneth A.
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ABSTRACT

This study was conducted to investigate the relative importance of social and academic factors in influencing the probability of transfer from a community college to a four-year college. The structural model used in the study was composed of the following constructs: the effect of social class, race, and gender on students' academically related behaviors in high school; the combined effect of student background and high school behaviors on high school outcomes; the effects of background, high school behaviors, and high school outcomes on community college behaviors; and the effect of background, high school behaviors, high school outcomes, and community college academic behaviors on the probability of transfer from a two-year to a four-year college. Nationally representative data from the "High School and Beyond" study were used to track a random sample of 2,500 students who attended community college within two years of high school graduation in 1980. Within four years after finishing high school, 24.3% of the community college students had transferred to a four-year college. The students' academic performance in college was the strongest direct predictor of eventual transfer. Family social class and high school factors (e.g., placement in the academic track, application to college while in high school, high grade point average, and high standardized test scores) exerted important indirect effects on the probability of transfer. Race and gender effects on transfer were found to be weaker than in earlier studies. While broader access to two-year institutions may appear to increase educational opportunities for socially and academically disadvantaged students, the fact that it is the more advanced students with better academic preparation in high school who actually transfer to four-year colleges suggests that the community college experience may actually perpetuate rather than ameliorate social stratification in higher education. (WJT)

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Student Characteristics Which Facilitate Transfer From 2-Year to 4-Year Colleges

Valerie E. Lee

Kenneth A. Frank

University of Michigan

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Student Characteristics Which Facilitate Transfer From 2-Year to 4-Year Colleges

ABSTRACT

This paper investigates the relative importance of social and academic background factors in influencing the probability of transfer to a 4-year college for a random sample of 2,500 students who attended community college within 2 years of high school graduation in 1980. Nationally representative longitudinal data from High School and Beyond were used to describe characteristics of 1980 high school graduates, grouped by their primary activity within 2 years after high school. Community college students fell about midway between those attending 4-year colleges and those who did not go to college with respect to both personal and academic background factors. By 4 years after finishing high school (1984), 24.3% of these community college students had transferred to a 4-year college. Factors describing students' academic performance in college were the strongest direct predictors of eventual transfer in a path analysis design. However, family background (social class) and high school factors (placement in the academic track, applying to college while in high school, high GPA, high standardized test scores) exerted important indirect effects on the probability of transfer. While broader access to 2-year institutions may appear to increase educational opportunities for socially and academically disadvantaged students, the fact that it is the more advanced students with better academic preparation in high school who actually transfer to 4-year colleges suggests that the community college experience may actually perpetuate rather than ameliorate social stratification in higher education.

Student Characteristics Which Facilitate Transfer From 2-Year to 4-Year Colleges

Advocates of community colleges argue that they offer access to higher education to socially disadvantaged and academically ill-prepared high school graduates who would otherwise be barred (by virture of costs and academic requirements) from attendance at 4-year college (Cohen and Brawer, 1982; Sawyer & Nickens, 1980). While the open-door policies of 2-year colleges have certainly increased access in recent decades, other researchers have argued that the increased educational equity implied by easier access does not necessarily translate into "real" higher education for disadvantaged students (Bowles & Gintis, 1976; Karabel, 1972, 1974; Pincus, 1980; Rosenbaum, 1976). The decreased social stratification in access to higher education offered by community colleges may be an illusion if a relatively small proportion of community college students eventually transfer to and graduate from 4-year institutions, or if those who use the community college route to the baccalaureate degree are of social and academic standing equivalent to those who arrive at that goal exclusively through 4-year colleges. The question, then, is whether increased access to higher education for relatively disadvantaged students offered by community colleges actually translates into increased college graduation rates for such students.

Community colleges currently enroll over one-third of all students in the American higher education system (National Center for Education Statistics [NCES], 1985). But less than a quarter of community college students eventually transfer to 4-year institutions, according to a report of the U.S. Department of Health, Education, and Welfare (1977). Even after relative differences in the initial social and academic status of these 2-year and 4-year college students are taken into account, their educational attainment is still less (Alba & Lavin, 1981; Dougherty, 1987; Velez, 1985). For community college entrants <u>in academically oriented college programs</u>, the relative proportions who eventually receive baccalaureate degrees is from 10% to 20% less than comparable students who enter 4-year colleges.

Several studies using the National Longitudinal Study data (NLS-72) to investigate the eventual transfer to 4-year colleges for the high

school class of 1972 who attended community college present a useful historical backdrop for the present study. NLS-72 students who initially enrolled in a 4-year program were 19% more likely to attain a bachelor's degree within 7 years than those who started in academic programs in 2-year colleges (Velez, 1985), whereas the differences were less (11-13%) for similar studies at 4 years after graduation (Anderson, 1981; Breneman & Nelson, 1981). Velez and Javalgi (1987) found that 51% of NLS-72 students enrolled in an academic program in community college had transferred within 7 years of high school graduation. While the most important factors in transfer involved students' integration into institutional life (e.g., living on campus), few students actually experienced such integration. Also found to be strongly related to transferring were social and academic background, as well as college academic performance and aspirations. In a review of several studies examining the comparative attainment of 2- and 4-year college students, Dougherty (1987) speculated that lower eventual educational attainment relates to the vocational thrust of 2-year institutions, whereas Meznek (1987) found academic factors (aspirations, academic integration, and institutional commitment) far more important in predicting transfer than social psychological factors for NLS-1972 students.

Analysis of the Parnes National Longitudinal Survey of Labor Market Experiences, which traced young men and women from the late 1960s through the mid-1970s -- revealed that a third of community college students eventually received the associate degree, but it is unclear how many of those continued their education in a 4-year college (Monk-Turner, 1983). For two groups of students who were roughly matched on high school performance and educational aspirations and who entered into 2- and 4-year institutions in the New York City university system (CUNY) in 1970, those who started in community college were 14% less likely to have received a bachelor's degree within 5 years (Alba & Levin, 1981).

To summarize, it appears that from one-fourth to one-third of all college bound high school seniors in the 1960s and early 1970s enrolled in community colleges. Of those students, considerably fewer community college students than their counterparts who began their college careers in 4-year institutions eventually attained a bachelor's degree. The longer the time period from high school graduation for these two groups,

the larger the differences in eventual degree attainment rates. Academic preparation, social integration, and family background proved to be important factors associated with transfer. While the differences in sample selection and length of time periods examined in these studies make it difficult to state the exact rates at which community college students of that period transferred to 4-year colleges, in general the transfer rates were low.

A polarity about social stratification, focusing on the differentiation between access to and persistence in higher education, characterizes the scholarly research on community colleges. Even though the expanded access which typifies these institutions in the last two decades may be argued as increasing social equity, the low transfer and baccalaureate attainment rates do not. It seems clear that, by design, community colleges are not academically or socially select institutions. With a considerable proportion of the curriculum devoted to either remedial or vocational training, the typical community college does not deliver a highly demanding academic program for the majority of its students. Community colleges enroll students who are more likely to be minority, who have much less academic preparation and lower achievement levels, and who come from families of considerably lower social class. Many studies have shown that these factors are associated with low persistence and attainment rates, and such relationships seem to be as typical of students in community colleges as elsewhere in higher education. Since these instituions enroll large numbers of America's college students, however, this sector must be taken seriously.

Research questions. This study attempts, first, to add to past research by providing descriptive information on the college-going behaviors of a large, current, and nationally representative sample of 1980 high school graduates. Exactly what proportion of America's recent high school graduates enter community college, compared to those entering 4-year colleges and universities? What are the demographic and academic characteristics of these 2 groups, and how do the students attending these 2 types of colleges compare to high school graduates who do not pursue higher education? Second, the central research question focuses on students attending community college, and examines the compa-

rative characteristics of those students who do and do not transfer within 4 years of high school graduation. Finally, the study presents a causal model constructed to typify the background, high school experiences, and college-level experiences which facilitate transfer to 4-year college.

Research hypothesis. Community colleges serve a larger proportion of American high school graduates than in previous decades, with these institutions offering opportunities for further education to socially and academically disadvantaged students. Although students in these institutions are likely to have one of 2 educational goals, either specialized vocational training or academic preparation for continued higher education, we concentrate on the latter goal because we consider all students to be potenially eligible to continue their education. Rather than focussing on the academic environment of community colleges, our analyses examine two sets of student characteristics and behaviors related to educational persistence: (a) family background and demographics, and (b) student behaviors and experiences in high school and college. Given that the students in 2-year institutions are less socially advantaged than those initially attending 4-year colleges, we seek to determine the degree to which differences in family background (particularly social class) within this group are associated with persistence. While we concede that community colleges offer opportunities for post-secondary education to disadvantaged students through relaxed access criteria, we wish to determine whether what happens to students within these institutions actually facilitates persistence to the baccalaureate degree for more than trivial proportions of the socially disadvantaged students they admit. While we expect that the the same factors predicting academic success in any educational environment -- ability, academic preparation, academically oriented coursework -- are also strongly related to transfer to a 4-year college, we hypothesize that social background continues to serve as a strong factor. That is, we suggest that while community colleges provide equitable opportunity through access, they are likely to be internally stratifying in what happens to students within them and afterwards.

Method

Sample and data. Data are drawn from High School and Beyond (HS&B), a multi-purpose nationally representative longitudinal study of American high school students. The sample comes from the original HS&B study of 1980 high school seniors, which included almost 30,000 randomly selected students in over 1,000 randomly selected high schools. Information was gathered on a large subsample of these students at 2 additional time points, at 2 (1982) and 4 (1984) years after high school graduation. The total sample for these 2 follow-ups (n=10,815) was used for the first part of the study. We have employed design weights for all analyses to compensate for oversampling at the base year and particularly in the follow-ups. Results may thus be generalized to America's high school class of 1980. Although the proportions of minority students in the population are relatively small, parameter estimates for minority group membership are stable because of oversampling those groups. Analyses investigating the probability of transfer from 2-year to 4-year college include all subjects who attended community college either full time or part time during any semester of the first 2 years after high school (1980-1982), resulting in a sample of 2,500. To be included in the "transfer" group, subjects had to have been enrolled in a 4-year college or university full-time or part-time during any semester of the period between 2 and 4 years after high school (1982-84) and attended community college prior to that time.

Analytic model. Although restricted to community college, the structural model was formed from more general theoretical and practical knowledge of sociological relationships in the secondary and post-secondary educational domains. We know, for example, that social background influences school performance, through the mediation of academic behaviors. High school performance, in turn, influences both academic behaviors in college and the eventual decision to continue education beyond community college. Behavior and performance in college mediate the relationships between social background and high school performance and the decision to transfer. Thus, student and family background, and behavior and performance in high school indirectly influence the probability of a student transferring.

Although we recognize that path analysis has been criticized for

its reliance on standardized (beta) regression coefficients (King, 1986),[1] our interest in assessing both direct and indirect effects has led us to select this technique as the basic multivariate approach (Pedhazur, 1982). The final dependent measure is whether or not the student transferred to a 4-year college, dummy coded (1=yes, 0=no). The structural model guiding our analyses is shown in Figure 1.

Insert Figure 1 about here

The model is composed of 5 constructs, each of which is operationalized by a set of variables. We first evaluated the effect of the construct student background (social class, race, and gender) on students' academically related behaviors in high school (curricular track, Catholic high school attendance, homework done, number of academic math courses taken, 10th grade educational aspirations, and parents' interest in academically-related activities). These relationships are represented by Path A in Figure 1. Second, we estimated the combined effect of student background and high school behaviors on high school outcomes (academic achievement, grade point average [GPA], and whether the student applied to college while in high school). These relationships are shown as Paths B and C.

Third, the effects of background, high school behaviors, and high school outcomes were estimated on community college behaviors (semester-hours of credit earned, semesters of full-time attendance, college grades, semesters of math and science, whether the student was working at the point of the first HS&B followup, whether or not the student majored in a science-related area, the contemplated age for entering the workforce full-time, and job satisfaction if working in college). Paths D, E, and F represent these relationships. Finally, we evaluated the effect of all these constructs -- background, high school behaviors, high school outcomes, and community college academic behaviors -- on the probability of transfer from a 2-year to a 4-year college. These relationships, which represent the direct effect of all model variables on the likelihood of transfer, are shown in Paths G, H, I, and J.

Analytic methods. A. OLS vs. LISREL. The standard statistical method for estmating path coefficients in such an analytic design is

ordinary least squares (OLS) regression (Cohen & Cohen, 1983; Pedhazer, 1982), which we have used in our analyses. We used pairwise deletion of missing data to make maximum use of the information contained in the data. In addition, we duplicated the analyses using structural equation modeling methods with the LISREL VI program (Joreskog & Sorbom, 1983), using the technique for two different purposes. First, we confirmed our OLS results using LISREL, and found that parameter estimates for path coefficients were quite similar. Due to this similarity, and because the distributional assumptions for the dependent measure are more restrictive for LISREL than OLS, we have reported only the OLS results. Secondly, we used LISREL to estimate direct and total effects in the path model. Here, LISREL was constrained to duplicate OLS assumptions (i.e., no latent constructs). In this way, total indirect effects may be computed as the differences between total and direct effects, rather than summing all indirect paths of a particular independent variable to the dependent variable estimated with OLS.

Results of all path analysis regressions are presented as standardized regression coefficients, in order to make comparisons of the magnitude of effects across variables scaled in different metrics. Direct effects of all model variables both on the final dependent measure and on intermedicate effects that typify path coefficients for the entire analytic model are estimated with OLS.

B. OLS vs. logistic regression. In theory, statistical analyses of relationships which are hypothesized to be non-linear in the particular structural form of being relatively weak at the extremes and strong in the middle ranges -- such as those with dichotomous dependent measures -- should use logistic methods (Logit). Allowing both categorical (dummy-coded) and continuous predictors, logit estimates effects as odds ratios, logarithmically transformed to produce linear instead of curvilinear relationships. OLS methods, however, are appropriate to estimate structural relationships in these situations if the distribution of the dichotomous dependent measure is non-extreme (i.e., between 20% and 80% -- Goodman, 1978). While our analyses are thus in the "safe zone" (i.e., 24.3% average transfer rate), we verfied OLS analyses using logistic regression. Comparisons of the rank order and statistical significance levels of the independent variables produced similar results for

the two methods, so we have chosen not report logit results.

Results

Who Goes Where?

There are only a few alternatives open to high school graduates for the future. In general, they must choose college or work (or both, more and more frequently). Over half (58%) of the high school class of 1980 attended college within 2 years of graduation, as seen in Table 1. Categories representating subjects' primary post-high school activity were mutually exclusive, using the following decision rules. If students enrolled in community college for even 1 semester during the 1980-82 period, they were so classified. Twenty-three percent of high school graduates (or 40% of the college-going group) attended community college within 2 years of high school graduation. This certainly underrepresents the proportion of the cohort attending these institutions, since it has been shown that only about half of the students ultimately attending community colleges enter within 2 years of high school graduation (US Bureau of the Census, 1985).

Insert Table 1 about here

The second data filter was 4-year college attendance, designating students who spent even one semester in such institutions (but were never in 2-year college). Thirty-five percent of high school graduates attended 4-year colleges soon after graduation. The third data filter was employment, for those young people not in college during the 2 years after graduation, but reported working 35 or more hours per week or military service during any half-year period between 1980 and 1982. Of the high school class of 1980, 34% went to work full time, close to the same proportion attending 4-year colleges. A final group -- neither working nor attending school at any time during the first 2 years after high school graduation -- comprised 8% of the class of 1980.

In the early 1980s, community colleges thus enrolled almost one-fourth of all high school graduates (and two-fifths of those in college) within 2 years of graduation. Not only is the proportion of students

going into higher education higher than in the 1970s (58% here), but community college attendees represent a larger proportion of this larger group. Specifically, the proportion of students who attended community college and entered higher education directly after high school graduation in 1980 (39.8%) is considerably higher than the proportions for the classes of 1966 & 1968 (24%, reported by Monk-Turner, 1983) or for the class of 1972 (30-35%, reported by Meznek, 1987). The community college sector has clearly expanded since the early 1970s.

Background. Differences in background characteristics of these groups echo previous research findings, showing strong patterns of social stratification among the different types of higher education. The average social class of community college students is about midway between 4-year college attendees and those who go to work. Clearly, social class is strongly related to "who goes where" after high school. The college-going behaviors of the 2 minority groups -- blacks and Hispanics -- differs considerably. Black students are slightly less likely to attend 2-year than 4-year college, and are almost twice as likely to attend college as to go to work. However, the non-working, non-student group has a higher proportion of blacks than any other group. Hispanics, on the other hand, are almost twice as likely to attend 2-year as 4-year colleges,[2] and are slightly more likely to go to work or to be in the non-college, non-work group. Females are slightly more likely to be in college than males, considerably less likely to be working, and quite likely to be in the group pursuing other activities.

Academic orientation in high school. Understandably, the academic orientation of students, especially achievement levels, varies considerably across these 4 groups. Community college attendees are well below their 4-year college counterparts in 12th grade achievement, and those who work (or do other things) are below the community college students in average achievement. While community college students are equally likely to come from either general or academic curricular tracks (39% for each), 4-year college students are more than twice as likely to be from the academic as the general track. Vocational track students, as the label suggests, are most likely to be working. General track students are heavily represented in the working and "other" groups, comprising almost half of both groups.

In terms of both social background and academic preparation, students attending community college are generally almost as different from of students in 4-year college as both groups of college students are from high school graduates not engaged in higher education. Clearly, these institutions are much more "accessible" to socially and academically disadvantaged high school graduates than 4-year colleges, supporting research findings which have claimed that these institutions offer more equitable access to higher education.

Which Community College Students Transfer?

The remaining analyses focus on the 2,500 students attending community college. Table 2 presents means for the transfer and non-transfer groups on all variables contained in the constructs of family background, high school behaviors, high school outcomes, and behaviors in community college which comprised the theoretical model shown in Figure 1. Mean differences, which have been tested with 2-tailed t-tests, are all significantly different ($p \leq .001$), with the exception of one variable (majoring in science).

Insert Table 2 about here

Background characteristics. The students transferring to 4-year college are of higher social class, less likely to be minority, and less likely to be female. In fact, the SES level of the transferees closely resembles the average social class of those students who originally enrolled in 4-year colleges (see Table 1). Almost 9% more males than females transfer, and the transfer group contains almost 4% fewer blacks and Hispanics than those who don't transfer. Although these bivariate relationships are unadjusted for other high school and college behaviors, transfer apprears to be strongly related to student background, giving support to the original hypothesis.

Academic behaviors and outcomes in high school. The community college students who transferred were also more academically oriented in high school. For example, transferees were twice as likely to have been in the academic curricular track in high school as the non-transfer

students, with the transfer group almost as likely to have come from the academic track as those who originally enrolled in 4-year college (61% vs. 65%). More than twice the proportion of the transfers as the non-transfers attended Catholic high school (11 vs. 5%). They reported having done more homework and having taken a year more of academic math in high school. Transfer students were more much likely to have planned college attendance early in their high school career (81% vs. 57%), and they reported that their parents were much more actively involved in their academic endeavors during that period.

Although the majority of both groups applied to college while in high school, transferees were 13% more likely to have done so (88% vs. 75%). Transfer students scored well above their non-transfer community college counterparts in 12th grade achievement but below those who went directly to 4-year college (Table 2). On several measures of academic orientation in high school, the students who attended community college and transferred to 4-year college resembled their counterparts who went directly to 4-year college more closely than their non-transferring community college counterparts. Although these results do not include statistical adjustment for background and other differences, they appear to offer support for the hypothesis that an early academic orientation is conducive for eventual transfer and persistence.

Academically related behaviors in college. Dougherty (1987) conjectured that a major factor for community college students' deficiencies in eventual attainment of the baccalaureate degree was the difficulty of transferring all the credits they had earned in community college, a phenomenon also noted in less recent studies (Knoell & Medsker, 1965; Phelegar, Andrew, & McLaughlin, 1981; Van Alstyne, 1974). Although we do not know from HS&B either the number of transferrable credits or whether the transferring students had obtained the associate degree (although it seems likely that the majority did so), obtaining such a degree is related strongly to accumulating credits, and both are related to transfer.

Regardless of how many credits were transferable, students who transferred earned almost twice as many credits during their first 2 years of college as those who did not (averages of 37 vs. 20 semester-hours).[3] In fact, the non-transfer group averaged fewer than 1 year of credit

(assuming 30 credits equivalent to 1 year). The transferees also reported spending more than twice as many semesters in full-time status (2.9) than did the non-transferees (1.2) during the first 2 years. Not only did the transferees have more credits, but they did better in their courses. They also took more math and science courses, which are more academic in nature.

While at least half of each group worked during college, the non-transfers were more likely to do so (66% vs. 49%). For working students, transferees were significantly less likely to be satisfied with the work they were doing. These differences may be indicative of the future focus of these 2 groups. From the perspective of those who transferred, their present job may be only to partially support themselves, while their focus is on furthering their education. From the perspective of those who did not transfer, their current work may be seen as a precursor to their future occupations.[4] Those who transferred planned to enter the workforce full time almost 2 years later than their non-transfer counterparts. This variable probably serves as a proxy measure of educational aspirations, where later work force entry indicates the anticipation of more time spent in school.

An orientation toward academic pursuits and away from work or social activities strongly differentiates those community college students who eventually transfer from those who do not. Again, this suggests confirmation of the initial hypothesis. However, the social, behavioral, academic, and status characteristics of students in our analytic model are known to be highly collinear. These relationships must, therefore, be evaluated with methods which take such intercorrelations among model variables into account.

Causal Model of Transfer to 4-Year College

Direct effects. Causal analyses focus on the 2,500 1980 high school graduates who enrolled in community college, with effects presented in the effect size metric of standardized (beta) regression coefficients. Table 3 presents the direct effects of all model variables on the likelihood of transfer (paths G, H, I, and J of Figure 1), with almost a third of the variance in the dependent measure (29%) explained by the model. In this final step of the path model, students' academic beha-

viors in community college exhibit the strongest direct effects on transfer. The direct effects of background factors on the probability of transfer are relatively weak, however, even though these factors showed showed large unadjusted differences (Table 2). Likewise, high-school academic behaviors exhibit weak direct relationships to transfer, with the exception of academic curriculum track enrollment and the number of academic math courses taken in high school. Academic performance in high school (i.e. achievement and GPA) is significantly related to the likelihood of transfer from community to 4-year college.

Insert Table 3 about here

Certain academic behaviors in college have particularly strong effects on the probability of transferring. Although accruing more credit-hours and being a full-time student facilitate transferring, it is credits in math and science which make the biggest difference. Although students who transferred were somewhat more likely to have indicated they were planning a major in science (Table 2), it is not the intended major, but the completed course work in these fields, which seems to matter. The age students plan to enter the workforce is also strongly and positively related to transfer, suggesting that transferees understandably intend to be in school longer. Although having a job is not significantly related to transfer, satisfaction with the job for those who work is strongly related, with students who are the <u>least</u> satisfied the most likely to transfer. Two interpretations suggest themselves here: (1) a choice for more education over present working conditions and compensation for those who transfer, or, (2) work attracting some students away from school, for those who didn't transfer.

The direct effects model for community college transfer thus confirms one part of the original hypothesis. Even though such students are less academically advantaged than those entering 4-year colleges immediately after high school graduation (especially in regard to achievement test scores), it is the vigorous pursuit of academics (over employment) while in community college which seems to facilite eventual transfer and educational persistence. Credit and coursework, full-time attendance, and plans to continue education are facilitators, while working and

satisfaction with the job (if employed) are inhibitors. Moreover, relative academic success while in high school is also directly related to eventual transfer for these students.

Indirect and total effects. While, in general, social background was not directly associated with eventual transfer for community college students (Table 3), those students who did and did not transfer evidenced considerable differences on these measures (Table 2). These relationships are thus likely to be indirect rather than direct. We investigated these indirect effects in 2 ways. First, using the framework described in Figure 1, we computed these effects in intermediate regressions to complete the path analyses (see Appendix). These may be used by interested readers to confirm results of our second method of computing indirect effects (using LISREL). The regression results indicate that several background variables are indirectly related to eventual transfer. These indirect relationships pass through high-school behaviors and outcomes, which in turn affect college behaviors. High school behaviors strongly affect high school outcomes, and also are related to many academically-oriented college behaviors. It is this route (via college behaviors) through which high school behaviors "translate" to transfer behavior. Many of these indirect relationships are strong, although the variety of the intermediate outcomes in this elaborate causal model restricts the ability to make strong generalizations. Total effects, as well as the relative contribution of direct and indirect effects are, therefore, of interest.

The total effects of all variables in the prediction model on the outcome are shown in Column 3 of Table 4. LISREL maximum likelihood (Column 1 of Table 4) and OLS least squares methods (Table 3) have produced identical estimates of direct effects. Indirect effects were calculated by subtraction, and are shown in Column 2 of Table 4. Although the significance of indirect and total effects are not tested in LISREL, their magnitudes may be compared to direct effects in column 1 to estimate significance levels. Using this standard, almost all total effects would be significant.

Insert Table 4 about here

In general, indirect effects are small compared to direct effects for most independent variables. In a few instances, however, the magnitude of indirect effects equals or exceeds corresponding direct effects. For example, the indirect effect of social class on the probability of transfer is larger than the direct effect (.11 vs .06). This is also the case for the effect of college aspirations in 10th grade. Whether or not the student applied to college directly from high school is also larger in the indirect than in the direct effect, with the sign of the effect reversed. The magnitude of the direct and indirect effects of academic track placement in high school are moderate and approximately equal.

Although the full regression model in Table 3 showed the relationship of social background (particularly social class) to transfer likelihood to be relatively weak, particularly in comparison to college behaviors, the total effects shown in Column 3 of Table 4 tell a different story. Here we see that the total contribution of SES to the probability of transfer, even after taking all other model variables into account, is the largest in the model. Moreover, attitudes and behaviors occurring early in high school (track placement, early aspirations) continue to play a large role in eventual transfer. As the general pattern of results found with OLS was confirmed when these relationships were examined with two other methods (structural equation modeling[5] and logistic regression[6]), these results have not been included.

Discussion

Who goes to community college? Almost a quarter of American high school graduates in the early 1980's (and 40% of those entering higher education) attend community college right out of high school, a higher proportion than in previous decades. These figures are particularly striking when considering the fact that only about half of eventual community college students enroll directly out of high school (NCES, 1985). Large numbers of Americans seeking higher education begin that experience in community college. The finding that these students are considerably less advantaged, socially or academically, is not new.

Young people are exhibiting some self-selection (or their high school performance and financial condition are exerting that selection for them) in choosing community college, since these institutions are inexpensive to attend and almost without entrance requirements.

Who transfers from community college? That almost a quarter of those who attend community college out of high school transfer to a 4-year college within 4 years, in likely pursuit of a baccalaureate degree, is important. That is, about 6% of all graduates of American high schools are using the community college route to college graduation. The figures would be even greater if we had looked farther out from graduation (e.g., 6 or 8 years) or included students who enter or return to 2-year college after several years out of school. Other studies examining persistence for community college students have generally included only students in an academic program in their samples, while this study examines all students in community college (including the considerable number who are likely enrolled in specific vocational or professional training). That makes the 25% transfer rate particularly striking.[7]

Given the large numbers that these figures represent, perhaps we should regard community college as something more than "cooling out" institutions which sap the educational motivation out of otherwise ambitious students, as Karabel (1972), Pincus (1980), and Rosenbaum (1976) have suggested. Students could be using these colleges to improve their academic records and perhaps gain remediation for skills missing from their high school education. Moreover, low tuitions and the ability for to live at home (and work) while taking college classes could make such institutions economically attractive to students from families with limited financial resources. While it is possible in individual cases that students who come into these institutions economically and academically disadvantaged could make use of the possibility of "transformation" that they offer, inducing such changes in students does not seem to be characteristic of the instituions. The most able, most academically advantaged, and least socially disadvantaged students are those who use the instituions as a passageway to continued higher education, not those students with fewer resources and/or fewer skills. Higher social class, lower probabilities of being minority or female, higher probability of being from the academic track, higher test scores and

grades in high school, and higher educational aspirations characterize the background of those who transfer compared to those who do not.

What facilitates transfer from community to 4-year college? Our discussion takes a backward view of the causal relationships explored here, moving back in time from college to high school to the family. The original hypothesis of an early press toward academics on the part of the students who enter and transfer from community colleges, perpetuated through a relatively strong academic performance, is comfirmed. The early academic press is characterized by certain social and family conditions which make such an orientation more probably for certain community college students. Considerably stronger parental interest in the academic pursuits of these students while still in high school (Table 2) confirms this early intent, as do the higher proportions with college aspirations at that time. Having been in the academic track in high school, and having taken more courses in academic curricular areas like mathematics, not only facilitates outcomes of high school such as high achievement and grades (which made future transfer more likely), but these high school factors -- track and courses -- also exert direct and positive influences on eventual transfer to baccalaureate-granting institutions for students in community college.

It is social disadvantage which impedes community college students from transferring, through the effect of social class on virtually all the academic behaviors associated with transferring. While social class is strongly and positively associated with almost all such behaviors, race/ethnicity is related only to a few, after social class is held constant. The preponderance of minority students in community college are Hispanic, rather than black. Being a minority student, per se, is not a hindrance for persistence. In fact, race effects are weaker here than in earlier national studies (Anderson, 1984; Astin et al., 1982; Breneman & Nelson, 1981; Dougherty, 1987; Velez, 1985; Velez & Javalgi, 1987[8]). Gender is marginally related to transfer, with females slightly less likely to do so. While confirming findings reported earlier (Anderson, 1981; Dougherty, 1987; Monk-Turner, 1983; Velez, 1985; Velez & Javalgi, 1987), the relationship of gender to transfer also appears to be weaker now than in previous decades.

Do community colleges increase social equity in higher education?

Yes and no. We have shown that community colleges continue to offer access to higher education to students from a broader range of social and academic backgrounds than do 4-year colleges. Thus, the reduced stratification in access which typified these institutions in the 1960s and 1970s appears to be sustained in the early 1980s. While we have shown that community colleges offer an alternative route to the baccalaureate degree to substantial numbers of high school graduates, these institutions do not transform non-academic students into academic performers.[9] Since it is the relatively "better" students coming in who come out with academic preparation strong enough to enable them to continue their education, we must conclude that these institutions are not reducing social stratification in academic higher education to any great degree.

Other research (summarized in Dougherty, 1987) has described the strong press toward vocational training in these institutions. While we have no direct evidence to either support or refute this, it seems clear that although community colleges offer both academic and vocational programs, there is less thrust toward the academic than the vocational side of the curriculum, at least for students who are not already motivated and prepared to head in that direction.

For an educational sector which touts its particular benefits for disadvantaged and minority students, and one which attracts such students in large numbers, these same students are relatively unlikely to move on successfully to the next academic stage. Since the family background and advantage which students bring to the instituion are the largest predictors of academic success within them, we can offer little evidence from our analyses that community colleges change individuals much. While relatively large numbers of students are using community colleges as an alternative route to 4-year college, it is students who could attend 4-year college in the first place -- by viture of higher family income and better academic preparation and motivation -- who appear to be taking advantage of this inexpensive alternative. Just offering the opportunity, without an institutional press in that direction, does not seem adequate for these colleges, if they claim to provide a second academic chance for higher education to socially and academically disadvantaged students.

Technical Notes

1. This is because standardized coefficients are functions of the unstandardized coefficient and the standard deviations of both the independent and dependent variables [$\beta = b(s_x/s_y)$]. Since the ultimate dependent variable here is dichotomous, s_y is constrained to a maximum of .5, which may inflate the β's somewhat.
2. This may reflect the fact that certain areas of the country (i.e. California and Florida) have especially well developed community college networks. These are also states which have relatively high proportions of Hispanic residents. It is difficult to identify the location of the colleges listed in the HS&B data file.
3. This argues against a simple dichotomy between the academic and vocational thrusts of these students' coursework in community colleges. Those who transfer are taking more courses of <u>all</u> types.
4. Since we are not able to investigate the occupational prestige level of actual jobs student held during this period, such a hypothesis, while logical, is untestable.
5. We also used LISREL to estimate the relationships between the latent factors of student background, high school behaviors, high school outcomes, college behaviors, and 4-year college transfer, freeing or eliminating parameters according to indications from early and exploratory LISREL analyses.
6. The proportion of variance explained by logit and OLS methods is approximately equal (29% and 31%, respectively).
7. The high school class of 1980 contained 3.04 million graduates, according to HS&B figures. Thus, over 180,000 students <u>per year</u> may be getting to 4-year colleges through the community college route. Such numbers are hard to ignore.
8. In fact, Velez and Javalgi (1987) found positive effects on transfer for the relatively small proportions of minority students in academic programs in community college in the 1970s.
9. Of course, not all community college students <u>want</u> to transfer.

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Table 1: Characteristics of 1980 High School Graduates Attending 4-Year College, 2-Year College, Working Full Time, and Engaged in Other Activities (n=10,815)

	4-Year College	2-Year College	Full-Time(a) Work	Other(b) Activities
Sample Size	3778	2500	3667	871
(% in Group)	(34.9)	(23.1)	(33.9)	(8.1)
Social Background:				
Social Class(c)	.267	.033	-.290	-.334
%Black	10.6	9.1	11.1	16.9
%Hispanic	5.6	10.3	11.5	14.7
%Female	53.0	52.4	45.8	61.6
Academic Preparation:				
Achievement(d)	55.1	50.4	46.4	44.9
Curriculum Track:				
% Academic	64.6	38.6	15.6	24.2
% General	25.4	38.5	45.1	43.8
% Vocational	10.0	23.0	39.3	32.1

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[a] Members of this group were not enrolled in any college within the first 2 years after high school. In addition, subjects were in at least one of the following three categories: (1) working full-time at any of four time points after high school graduation in 1980 (2/80, 2/81, 10/81, or 2/82); (2) in military service during that period; or (3) working 35 or more hours per week at any job during the first 2 years after high school graduation.

[b] Members of this group were neither in college nor did they work full time at any point in the first two years after high school graduation.

[c] SES variable is standardized (mean=0, s.d.=1) on the entire HS&B sample at the base year. Slight differences resulted from sampling down for followups.

[d] Achievement test standardized (mean=50, s.d.=10) on the entire HS&B sample at the base year. It is a composite of reading, vocabulary, and math.

Table 2: Characteristics of Community College Students from the High School Class of 1980 Who Did and Did Not Transfer to 4-Year College by 1984

	Transferred (a)	Did Not Transfer	Entire Sample
Sample Size	608	1892	2500
(%in Group)	(24.3)	(75.7)	(100.0)
Background:			
Social Class	.248*** (b)	-.051	.033
%Black	6.1	10.2***	9.1
%Hispanic	7.2	11.3***	10.3
%Female	45.2	54.1***	52.4
HS Behaviors:			
%Acad.Track	61.2***	30.8	38.6
%Catholic HS	11.3***	5.4	6.7
Hrs.Homework/Wk.	4.85***	3.54	3.90
# Math Courses,HS (c)	3.00***	2.08	2.29
%College Aspirations, Gr.10 (d)	81.2***	56.6	62.2
Parental Interest in S's Academics (e)	.501***	.143	.237
HS Outcomes:			
Achievement	53.84***	49.26	50.41
GPA (1980)	3.11***	2.79	2.88
%Applied to Coll. While in HS	88.1***	75.3	78.3
College Behaviors:			
#Semester Hrs.Credit in Comm.College	36.99***	20.24	25.05
#Semesters, FT in Comm.College	2.89***	1.22	2.14
GPA (1982)	2.87***	2.72	2.76
# Semesters,Math	0.94***	0.60	0.68

College Behaviors, Contd:			
# Semesters,Science	1.03***	0.46	0.61
%Science Majors,'82 (f)	24.0	20.4	21.5
Age (in Yrs.),Planning to Start FT Work	21.49***	19.54	20.0
%Working, Z-82	49.1	66.3***	60.9
Job Satisfaction, (g) if Working	-0.30	0.05***	-.032

---

[a] Students counted as transferred if enrolled in a 4-year college in February of 1984, 4 years after HS graduation.

[b] Asterisks indicate nominal significance levels, determined by t-tests; *** $p \leq .001$.

[c] Sum of years of coursework in in Algebra I, Geometry, Algebra II, Trigonometry, Pre-Calculus, and Calculus while in high school.

[d] Students who reported (retrospectively, in 1980) having college expectations in 10th grade.

[e] Standardized factor score (mean=0, s.d.=1) of variables measuring whether parents monitor school work, know what student is doing, how much parents influenced academic plans during high school and after graduation.

[f] Proportion of students indicating in 1982 that they planned to major in physical or life sciences, mathematics, computer science, or engineering.

[g] Standardized factor score (mean=0, s.d.=1) of variables measuring satisfaction with aspects of most recent job (pay and benefits, challenge, working conditions, opportunities for advancement, job security, supervisor, relationship with coworkers).

Table 3: Full Model for Predicting Transfer to 4-Year College for Community College Students

Independent Variables:	Standardized (Beta) Regression Coefficients
Background:	
Social Class	.06* (a,b)
Black	-.01
Hispanic	-.01
Female	-.05
High School Behaviors:	
Academic Track	.06*
Catholic High School	.04
Hours of Homework/Week	.03
# Math Courses, High School	.06*
College Aspirations, Gr.10	.03
Parental Interest in Academics	.05
High School Outcomes:	
Achievement	.07*
GPA (1980)	.07*
Applied to College While in HS	-.03
College Behaviors:	
#Semester Hrs.Credit, Comm.College	.08*
#Semesters, FT in Comm.College	.06*
GPA (1982)	.02
# Semesters,Math	.12***
# Semesters,Science	.16***
%Working, 2-82	-.05
%Science Majors,1982	-.12***
Age, Planning to Start FT Work	.15***
Job Satisfaction, if Working	-.12***
% Variance Explained (R^2)	29.0

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[a] Effect sizes in standardized regression coefficients. This convention applies to all regression results presented in this paper.

[b] Asteriks indicate nominal significance levels (***=p<.001; **=p<.01; *=p<.05).

Table 4: Direct, Indirect, and Total Effects of Full Model Predicting Transfer to 4-Year College for Community College Students

Independent Variables	Direct Effects (a)	Indirect Effects (b,c)	Total Effects (c)
Background:			
Social Class	.06*	.11	.17
Black	-.01	-.02	-.03
Hispanic	-.01	-.02	-.03
Female	-.05*	-.01	-.06
High School Behaviors:			
Academic Track	.06***	.07	.13
Catholic High School	.04*	-.01	.03
Hours of Homework/Week	.03	.03	.06
# Math Courses, High Scl	.06*	.08	.14
Coll. Aspirations, Gr.10	.03	.07	.10
Parental Interest,Acad.	.05**	.03	.08
High School Outcomes:			
Achievement	.07**	--	.07
GPA (1980)	.07**	.04	.11
Applied College, HS	-.03	.05	.02
College Behaviors:			
#Sem.Hrs.Credit,Comm.Coll.	.08***	--	.08
#Sem. FT in Comm.Coll.	.06**	--	.06
GPA (1982)	.02	--	.02
# Semesters,Math	.12***	--	.12
# Semesters,Science	.16***	--	.16
%Working, 2-82	-.05**	--	-.05
%Science Majors,1982	-.12***	--	-.12
Age, Planning FT Work	.15***	--	.15
Job Satisfaction, if Working	-.12***	--	-.12

[a] Effects computed with LISREL, constrained to be indentical to OLS regression. Significance levels slightly higher with LISREL than OLS.

[b] Indirect effects computed as the difference between total and direct effects.

[c] Significance tests of total and indirect effects not available with LISREL.

Appendix

A: Effect of Background on High School Behaviors; Effect of Background and High School Behaviors on High School Outcomes

	Dependent Variables								
	Catholic High Sch.	Academic Track	Parental Infl.,Acad.	Homework, Hours/Wk.	#Academic Math Crs.	College Asp.,10th	Achievement	GPA, 1980	Applied, Coll.,HS
Independent Variables:									
Background:									
Female	.00	.01	-.03	.10***	-.05**	.09***	-.04*	.17***	-.01
Black	-.04	-.02	.03	.00	-.07***	.04	-.22***	-.12***	.02
Hispanic	.01	-.03	.04	.03	-.07***	.03	-.17***	-.08***	-.03
Social Class	.10***	.15***	.22***	.12***	.26***	.20***	.08***	-.09***	-.07***
High School Behaviors:									
Catholic High School							-.04**	-.05*	.01
Academic Track							.15***	.10***	.10***
Parental Interest in Academics							-.01	.02	.14***
Hours of Homework/Week							-.02	.08***	.06**
# Math Courses, High School							.37***	.31***	.10***
College Aspirations, Gr.10							.06**	.03	.08***
R^2	1.2	2.0	4.6	2.1	9.4	4.4	36.4	20.9	9.3

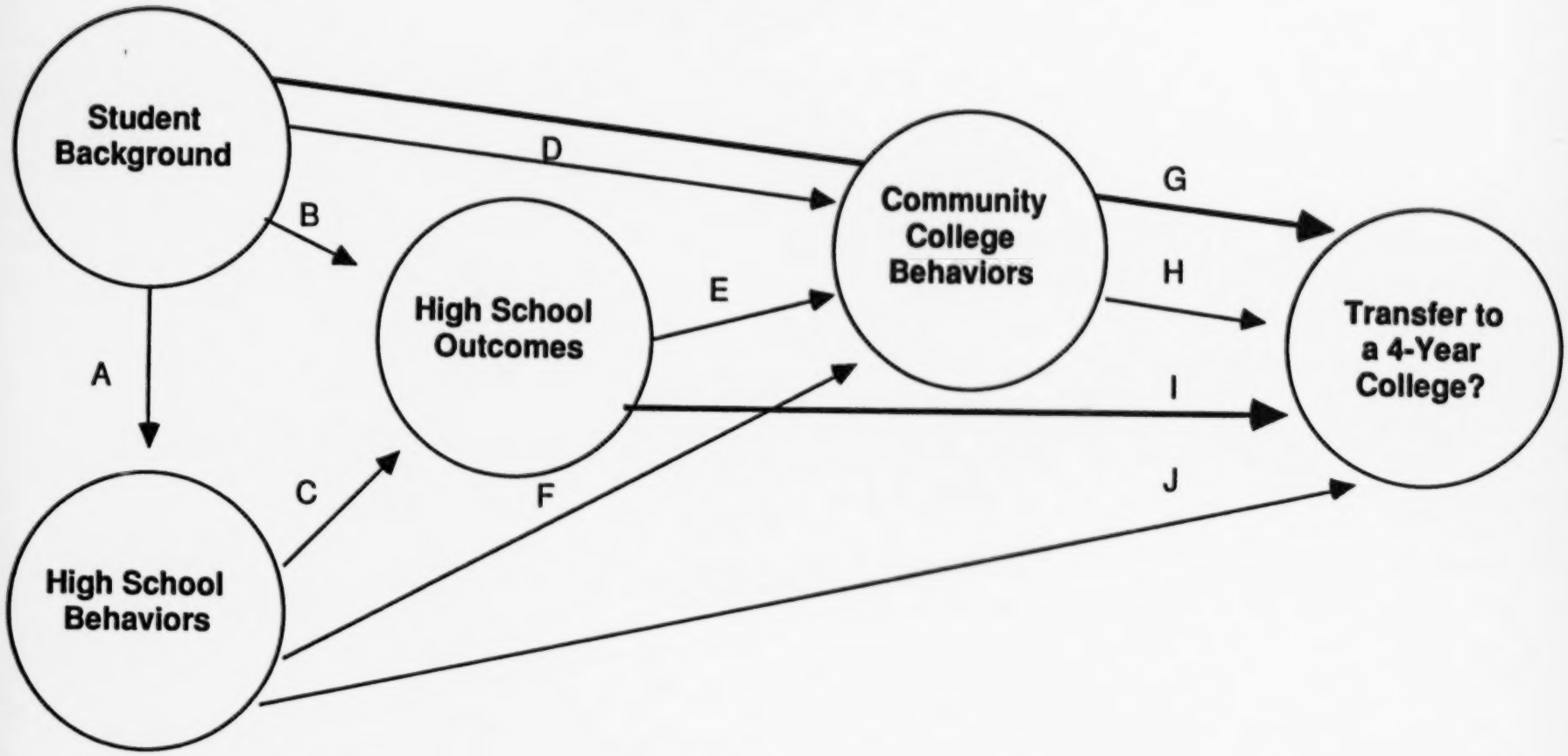
(%Variance Explained)

B: Effect of Background, High School Behaviors, and High School Outcomes on College Behaviors

	Dependent Variables								
	College GPA (1982)	# College Math Crs.	#College Science Crs.	Science Major,'82	Age Plan FT Work	Satisfaction Current Job	#Semester Hrs.Credit	#Sem. FT in Conn.College	Working, 2-82
Independent Variables:									
Background:									
Female	-.03	-.16***	-.04	-.22***	-.16***	-.02	-.10**	-.06**	.07**
Black	-.07**	.09***	.01	.04	.02	-.04	-.05	.02	.06*
Hispanic	-.01	.04*	.02.	.03	.03	.03	-.02	.01	-.01
Social Class	-.01	-.01	.05*	-.01	.09***	.03	.01	-.02	.01
High School Behaviors:									
Catholic HS	-.06**	-.01	-.02	-.05	.01	-.02	-.01	.01	.05*
Acad.Track	-.02	.04	.12***	.02	.09***	.01	.07**	.05	-.06*
Par.Int.,Acad.	-.06**	.01	.05*	.06*	.06**	-.09***	.05*	.06*	-.05*
Hrs/Wk Homework	.06**	.08***	.00	.02	.06*	-.03	.00	.01	-.07**
# Math Crs.	.09***	.15***	.07**	.19***	.08**	.05	.07*	.04	.02
Coll.Asp.,10th	-.05*	.05	.11***	-.04	.14***	.04	.10***	.10***	-.02
HS Outcomes:									
Achievement	.01	-.11***	.07*	.06	-.04	-.10***	.03	.01	-.01
HS GPA	.36***	.10***	.13***	.03	-.04	.01	.13***	.07**	.03
Applied Coll. From HS	-.02	.04	.08***	.00	.04	-.01	.11***	.23***	-.02
R^2	17.4	9.2	15.4	11.4	11.8	1.7	13.3	12.7	2.5

(%Variance Explained)

Figure 1: Path Model to Investigate Direct and Indirect Relationships Between Student Background, High School Behaviors, High School Outcomes and Community College Behaviors as Predictors of Transferring to 4-Year College for Community College Students



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